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SPECIAL PUBLICATION

LONG-RANGE ICE OUTLOOK
EASTERN ARCTIC (1966)

Oceanographic Prediction Division

MAY 1966

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MARINE SCIENCES DEPARTMENT
U.S. NAVAL OCEANOGRAPHIC OFFICE
WASHINGTON, D.C. 20390
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ABSTRACT

An outlook of expected sea ice conditions in the eastern North American Arctic is presented for the period mid-May through mid-August 1966. Oceanographic and climatic data for the Eastern Arctic were analyzed in terms of sea ice growth during the past winter. These analyses, combined with observed ice conditions for the period 31 March through 6 April and a comprehensive study of historical ice and climatic information, formed the basis for the 1966 Ice Outlook. Evaluation of this information indicates that present ice conditions in the Labrador Sea and along the Newfoundland coast are similar to those observed in 1960. However, present and prognostic weather conditions indicate a trend toward lighter than normal conditions along the Labrador coast similar to those observed in 1965. Extremely heavy ice conditions in conjunction with environmental factors indicate 1957 and 1958 to be analogous years in the approaches to Kulusuk and in Baffin Bay respectively. Accordingly, Goose Bay is expected to open earlier than normal and Thule, Sondre Stromfjord, and Kulusuk later than normal. The approaches to Itivdleq were reported ice free by the early reconnaissance on 3 April. In terms of the 1965 ice season, Goose Bay will open slightly earlier than last year, Thule and Kulusuk about one week later, and Sondre Stromfjord about 10 days to two weeks later than in 1965.

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LONG-RANGE ICE OUTLOOK 1966

I. INTRODUCTION

The Long-Range Ice Outlook for 1966 presents a written and graphic description of expected ice conditions during the forthcoming operations of the Military Sea Transportation Service (MSTS) in the eastern Arctic. Prognostic monthly ice charts showing the expected distribution of sea ice from mid-May through mid-August are presented.

The outlook is developed initially from an evaluation of oceanographic and climatic conditions prevailing during the growth season. Utilizing known empirical and theoretical relationships, these factors are used to quantitatively determine thickness, character, and distribution of the ice developed during the winter.

In addition, a comprehensive aerial survey of the entire area from 31 March through 6 April provides information on distribution, age, and roughness of the ice under consideration. A comparison is then made between the current environment and ice conditions experienced in preceding years to determine if an analogous situation exists. Incorporating this information with the 30-day prognostic sea-level pressure pattern, ice conditions are projected for one month. Thereafter, the monthly charts are developed by assuming environmental conditions will be similar to those observed during the analogous year.

Opening dates for ports of major interest in MSTS resupply operations are given in table 1, and a more detailed description of expected ice characteristics is given in the text. Place names used in this text are shown in figure 1.

II. ANALYSIS OF ENVIRONMENTAL DATA

A. Oceanography

The time of initial freezing and the subsequent rate of growth of sea ice depend on the thermal and saline structure of the sea after the occurrence of heat budget reversal. These characteristics, along with air temperatures expressed in cumulative degree days of freezing, snow cover, and radiational cooling, were considered to determine the heat loss and resultant ice growth. Dates of theoretical initial ice formation and ice thickness on 15 March based on these computations are presented in figure 2.

B. Climatology

Throughout the ice growth period, the ice drift depends on the mean sea-level circulation which is controlled by the path of the migratory pressure systems. The ice growth period is considered to

extend from 15 October to 15 March. From October through December the mean wind patterns throughout the entire area were near normal. However, below normal wind speeds in northern Baffin Bay and Thule during December were the only exception to this pattern. During January and February anomalous wind patterns prevailed throughout the area except for normal onshore flow along the east Greenland coast. Below normal wind speeds continued in the Baffin Bay and Thule areas during January, and an anomalous southeasterly wind occurred in February. A deviation from the normal northwesterly flow during January and February was observed in the Labrador Sea and Davis Strait where moderate northeast winds or onshore wind flow were evident. A 500- to 600-mile southward displacement of the Icelandic low during this period caused the abnormal wind regime for the Labrador and west Greenland areas. A return to more normal conditions was observed in early March.

Vectors representing average ice drift for the entire ice growth period were computed for selected points within the area and are shown in figure 3. Throughout the area, directions veered 45 to 90 degrees from last year's vectors with the greatest deviation along the Labrador coast where an onshore ice drift was evident. Onshore drift was also observed along the east Greenland coast, and southeasterly drift was prevalent in the Baffin Bay and Thule areas. Magnitudes were generally moderate to strong, except along the east Greenland coast and from Goose Bay southward where magnitudes were light. The computed ice growth in figure 2 shows that the ice thickness in Melville Bugt and the vicinity of Bylot Island was 50 to 60 inches, which was near normal. The ice thickness along the west Greenland coast which usually averages 30 inches at Disko Island to 60 inches at 75N was 10 to 20 inches thinner than normal. Along the Baffin Island coast southward to Cape Dyer, the computed ice thickness was approximately 10 inches thinner than the normal 40 to 60 inches. Along the Labrador coast ice thickness was 10 to 20 inches, which was near normal.

III. PRELIMINARY SURVEY OF ICE CONDITIONS

A. General

Preliminary ice reconnaissance was flown from 31 March through 6 April 1966. A P3A from PATRON 10, Argentia, Newfoundland, surveyed the ice in the Labrador Sea, Davis Strait, and Baffin Bay. A P3A from PATRON 10 in Keflavik, Iceland, reconnoitered the east Greenland coast. Danish, Canadian, and U.S. Coast Guard ice reconnaissance during this period supplemented ice data in these areas. Results of these surveys are shown in figure 4. A legend of ice terminology and symbols is presented in figure 5.

B. Comparison of Observed Ice Boundaries

Location of the ice boundary north of 58N was similar to that observed in 1962 and 1965 and, south of that latitude, was very similar to that of 1964. In the vicinity of Goose Bay the outer pack boundary

was 30 to 45 miles farther seaward than it was in 1965. The boundary intersected the west Greenland coast at 6720N, considerably farther north than it was in 1965.

Along the east Greenland coast, the outer pack boundary was oriented similar to the 1958 boundary. The pack was much more compact than observed in 1965.

Ice boundaries observed during preliminary reconnaissance from 1954 to 1965 are shown in figures 6 through 8. The 1966 ice boundary is shown in figure 4.

C. Observed Ice Conditions

1. Newfoundland and Labrador Coasts

Concentrations 30 to 60 miles seaward of the Newfoundland coast and north of 48N to just south of St. Anthony consisted of eight-tenths thick winter ice. Adjacent to this close pack boundary predominant concentrations of two- to five-tenths of mainly thick winter ice were observed from 47N to the outer approaches of Goose Bay. Open water was reported along the coast from Cartwright to St. Anthony. Small amounts of medium winter and young ice were also observed in these areas. Close pack ice was reported in the Strait of Belle Isle.

Between Indian Harbour and Hopedale, close pack extended 70 miles seaward. The age of the ice was chiefly thick winter with about 10 to 20 percent medium winter and some young polar present. From Hopedale to Cape Chidley, very close and close pack ice was observed. Within the outer pack boundary, the floe size was primarily cake, brash, and small floe. Vast floes were present within the close pack ice. Southeast of Cape Chidley a large area of very open pack ice was observed. Light ridging and moderate snow cover was present on all ice. Fast ice was present in western Hamilton Inlet, Lake Melville, and Terrington Basin. Open water was reported in the Goose Bay Narrows, and very open pack was observed in eastern Hamilton Inlet.

2. Baffin Bay

a. Baffin Island Coast and Davis Strait

The ice in Davis Strait consisted chiefly of close pack, 60 percent of which was thick winter, 30 to 40 percent medium winter, and the remainder young and young polar ice. The western portion contained big and vast floes, and the eastern portion contained small and medium floes and some brash and cake. Ridging was moderate throughout the area.

An area of very open pack was reported in the vicinity of Resolution Island. Very close pack extended 30 to 60 miles offshore

from Brevoort Island to Hoare Bay then offshore and northward to approximately 6740N. Thick winter and a considerable amount of young polar ice were present. Adjacent to the coast from Hoare Bay to Broughton Island, close pack concentrations of predominantly thick and medium winter ice were observed. Close pack ice was reported along the remainder of the Baffin Island coast with heavy ridging observed.

b. Central and Northern Baffin Bay

Northward wind drift and below normal temperatures throughout the winter were reflected in the very close pack ice conditions observed in Baffin Bay. In Melville Bugt the predominant ages observed were 70 to 80 percent thick winter and the remainder medium winter with some young polar ice. In central Baffin Bay dominant thick winter, 10 to 20 percent medium winter, and young polar ice were reported. Heavy ridging prevailed throughout the area. The North Open Water was in evidence north and west of 76N and 72W in Smith Sound. West of 75W the North Open Water extended south to 7430N. Concentrations totaled nine-tenths and consisted of 40 percent thick winter, 40 percent medium winter, and 20 percent young ice. In the southern portion of Smith Sound an area of very open pack was observed.

c. West Greenland Coast

Fast ice was observed in North Star Bugt and in a 10- to 30-mile wide band which extended from the entrance along the coast to the vicinity of Kap Seddon. Very close pack concentrations were observed in the offshore pack as far south as 70N. The ages consisted primarily of thick winter ice with 10 to 20 percent medium winter and young polar ice. A small area of very open pack was observed along the coast between 72N and 73N.

Open and close pack ice extended from 70N to the edge of the pack boundary at 6720N. A considerable amount of medium winter ice and various forms of young ice were present in this area. The ice appeared to be more broken as indicated by the presence of large amounts of cake, brash, and small floes. Floe sizes increased north of 69N.

Sondre Stromfjord was ice free to just south of Kap Look. The remainder of the fjord was congested with fast ice. Itivdleq Fjord was reported ice free.

3. East Greenland

The outer pack boundary extended from 68N 20W southwestward to a point approximately 40 miles north of Iceland to 64N 39W and then 50 to 70 miles seaward along the remainder of the coast around the southern tip of Greenland intersecting the coast at 6020N. Open water was observed in the immediate approaches to Kap Farvel. Nine-tenths thick winter ice was observed to 65N. North of 65N close pack

concentrations of thick winter, young polar and arctic pack ice were observed. North of 66N ice concentrations within the outer pack boundary were unobserved owing to adverse weather. However, it is believed that open and very open pack were present. Ridging was extremely heavy north of 65N.

IV. OUTLOOK

A. General

Ice conditions determined by environmental conditions and confirmed by preliminary reconnaissance were quite similar to those observed in 1958 in Baffin Bay and Davis Strait and in 1960 in the Labrador Sea. However, prognostic weather charts indicate conditions becoming similar to those existing in 1964 and 1965 along the Labrador Coast. Accordingly, prognostic ice conditions for mid-May through mid-August, shown in figures 9 through 12, reflect conditions observed during those years.

TABLE 1

Opening Dates for Harbors

Harbor	Escorted*	Unescorted**
Itivdleq	Ice Free 3 April	
Sondre Stromfjord	2 June	9 June
Goose Bay	17 May	27 May
Thule	17 July	5 August
Kulusuk	20 July	22 August

*Concentration in approaches less than 8/10 and fast ice, if any, in harbor well weakened.

**Concentration in approaches and harbor 1/10 or less.

1. Newfoundland - Labrador Sea

By mid-May the southern edge of the pack boundary should have receded to north of St. Anthony with some open pack remaining in the Strait of Belle Isle. Very open pack should extend northward to nearly 54N, and an enlarged area of open water should be in evidence along the shore from Hamilton Inlet to Belle Isle. Concentrations of open and close pack ice should continue to be advected into the outer Goose Bay approaches during this period. From Hamilton Inlet to Cape Chidley close pack concentrations will prevail with very open pack developing between Cape Chidley and Resolution Island. Above normal temperatures which occurred throughout the winter are forecast to continue; hence the outer approaches should be safe for escorted shipping by 17 May.

By mid-June expected offshore flow and increased warming should have disintegrated the ice to a point where the boundary is north of 55N. Throughout May belts and patches of very open pack should occasionally drift into the Goose Bay approaches from the Hopedale ice trap. By 27 May Goose Bay should be safe for unescorted shipping.

By mid-July only remnant concentrations of open and close pack should remain from Hopedale to Cape Chidley.

2. Davis Strait and Baffin Island Coast

Little change in this area from the close and very close pack ice observed during the early reconnaissance should occur by mid-May. A slight recession in the outer pack boundary should be evident, and variable concentrations of very open and open pack should appear along the outer edges of the pack boundary.

By mid-June, owing to increasing temperatures, the ice concentrations are likely to weaken. A shore lead from Bylot Island to generally 7130N and open water areas in the entrance to Hudson Strait and approaches to Frobisher Bay should appear. An area of very open pack should be observed in the vicinity of Cape Dyer.

The pack should have receded and narrowed considerably with the major portion extending northward from Loks Land by mid-July. Open water should be observed in the vicinity of Cape Dyer, and the Baffin Island shore lead should be south of Cape Christian by this time. However, a large amount of close pack ice will remain in Davis Strait.

By 15 August the only ice remaining south of Cape Dyer will be some remnant pack located in Cumberland Sound. Relatively large concentrations of open and close pack ice should be observed from Cape Hooper to Cape Henry Kater and extending seaward into central Baffin Bay.

3. Central and Northern Baffin Bay

Little change is expected in this area by mid-May owing to the predicted below normal temperatures. The North Open Water area may increase slightly, and the ice should become somewhat thinner. Due to the disintegration of medium winter and young ice resulting from an expected increase in temperatures, enlargement of the North Open Water should be in evidence by mid-June. An ice-free lead should start to form from the entrance to North Star Bugt to Kap York. A large open water area should be observed northwest of Thule, and large concentrations of very open and open pack should appear between Devon Island and the west Greenland coast. In Melville Bugt and the remainder of Baffin Bay, heavy concentrations of close and very close pack are expected to remain.

By mid-July concentrations in northern Baffin Bay should have become primarily very open pack and open water with a large ice-free area southeast of Devon Island.

The ice-free lead in the vicinity of Kap York should extend eastward to 65W, and concentrations through the middle passage should be six- to eight-tenths. Owing to below normal temperatures throughout the ice growth season, expected slow warming during the disintegration period, and northwesterly wind drift, the approaches to Thule are not expected to be safe for escorted shipping until 17 July and unescorted shipping until 5 August. Belts and patches of variable concentrations may remain somewhat longer.

Only concentrations of very open pack should remain in central Baffin Bay by mid-August.

4. <u>West Greenland</u>

Water temperatures in the Irminger Current appear to be higher than in 1965 as indicated by the northward extension of the pack boundary observed during the early reconnaissance. By mid-May the west Greenland lead should extend to 7130N with areas of very open pack reaching to Upernavik. By 15 June ice-free conditions should extend to 74N and to Kap Seddon by mid-July. Ice-free conditions along the shipping route to Thule should prevail by mid-August.

5. <u>East Greenland</u>

Extremely heavy concentrations of polar ice north of 66N combined with northeasterly winds will result in the southward advection of polar ice concentrations during May, June, and early July. Below normal temperatures will somewhat retard the disintegration of ice in this area. Close pack concentrations should remain as far south as 65N until after mid-July. South of 65N only remnant open and very open pack should remain. By mid-August concentrations of open pack and close pack should still be in evidence in the vicinity of Kulusuk.

B. <u>Harbors</u>

1. <u>Goose Bay</u>

Abnormally high temperatures during the winter have retarded the ice growth. As a result open water from the western portion of Hamilton Inlet to the Goose Bay narrows and well-puddled fast ice in Lake Melville and Terrington Basin are expected by early May. With increasing temperatures forecast to continue, the inner approaches to Goose Bay should be ice free by 20 May.

2. Itivdleq

Early reconnaissance on 3 April shows this site to be ice free.

3. Sondre Stromfjord

Owing to the northward extent of the pack boundary and warm water, Sondre Stromfjord is now ice free to nearly Kap Look. However, below normal air temperatures have resulted in heavier-than-normal ice growth in the remainder of the fjord. Consequently, breakup of ice in the anchorage area (in the absence of icebreaker entry) may be somewhat slow, and the concentrations will not become less than eight-tenths until 2 June, which is slightly later-than-normal. Temporary congestion of the ice in the vicinity of Kap Robinson is expected during the first week in June, and general breakup of the ice is expected by 5 June. By 9 June the entire fjord should become ice free.

4. Thule

Fast ice in North Star Bugt is expected to be very weak by 5 July and well broken by 10 July. Thereafter, variable concentrations will occur owing to changing wind conditions. However, by approximately 20 July, North Star Bugt should be nearly ice free. Many icebergs, however, are expected to remain in the harbor and its approaches.

5. Kulusuk

Southward advection of storis ice* and southwesterly wind drift will result in the presence of variable concentrations at Kulusuk. Very open pack should be observed in the immediate approaches by mid-July; however, owing to extremely heavy concentrations in the source area and a significantly large accumulation of frost degree days, the Kulusuk approaches should not be open for escorted shipping before 20 July. Variable concentrations of open to close pack will continue to be advected into the approaches until 22 August, at which time unescorted shipping into Kulusuk may be expected.

V. GENERAL INFORMATION

A. Brief on Icebergs

The glaciers of Greenland are the source of almost all bergs encountered in the area. Because of their great draft, bergs tend to be more responsive to deep currents than to surface winds. Accordingly, nearly all icebergs sighted south of 65N along west Greenland originated

*Remnants of fused pressure ridges of polar ice drifting along the Greenland coast from the Arctic Ocean.

from glaciers on east Greenland and tend to move southward along the southeastern coast of Greenland, northward along west Greenland, and southward along the Baffin Island and Labrador coasts. The distance covered by bergs drifting from the southwestern coast of Greenland to southern Newfoundland is about 1,800 miles and requires about 3 years to traverse. However, most bergs disintegrate or are trapped in the many indentations along the Baffin Island and Labrador coasts, so that only about 1 in 20 bergs survives the journey.

Owing to offshore currents, the coastal area between Godthaab and Holsteinsborg is relatively free of icebergs. The heaviest concentration of bergs north of Holsteinsborg and Egedesminde occurs in the vicinity of Disko Bugt, especially during June and July. Accordingly, many of the bergs in Baffin Bay and in the western Labrador Sea are believed to originate from this area.

B. Freezeup Information

Freezeup information including dates of initial ice formation, as well as an average of all the dates at specific sites for a number of individual years, is presented in figure 13. The freezeup information applies to the immediate harbor or coastal sector of the site indicated. Although initial ice generally does not hamper shipping, the dates provided give some indication as to the beginning of freezeup in various areas and of the variability that exists from year to year.

FIGURE I PLACE NAME CHART

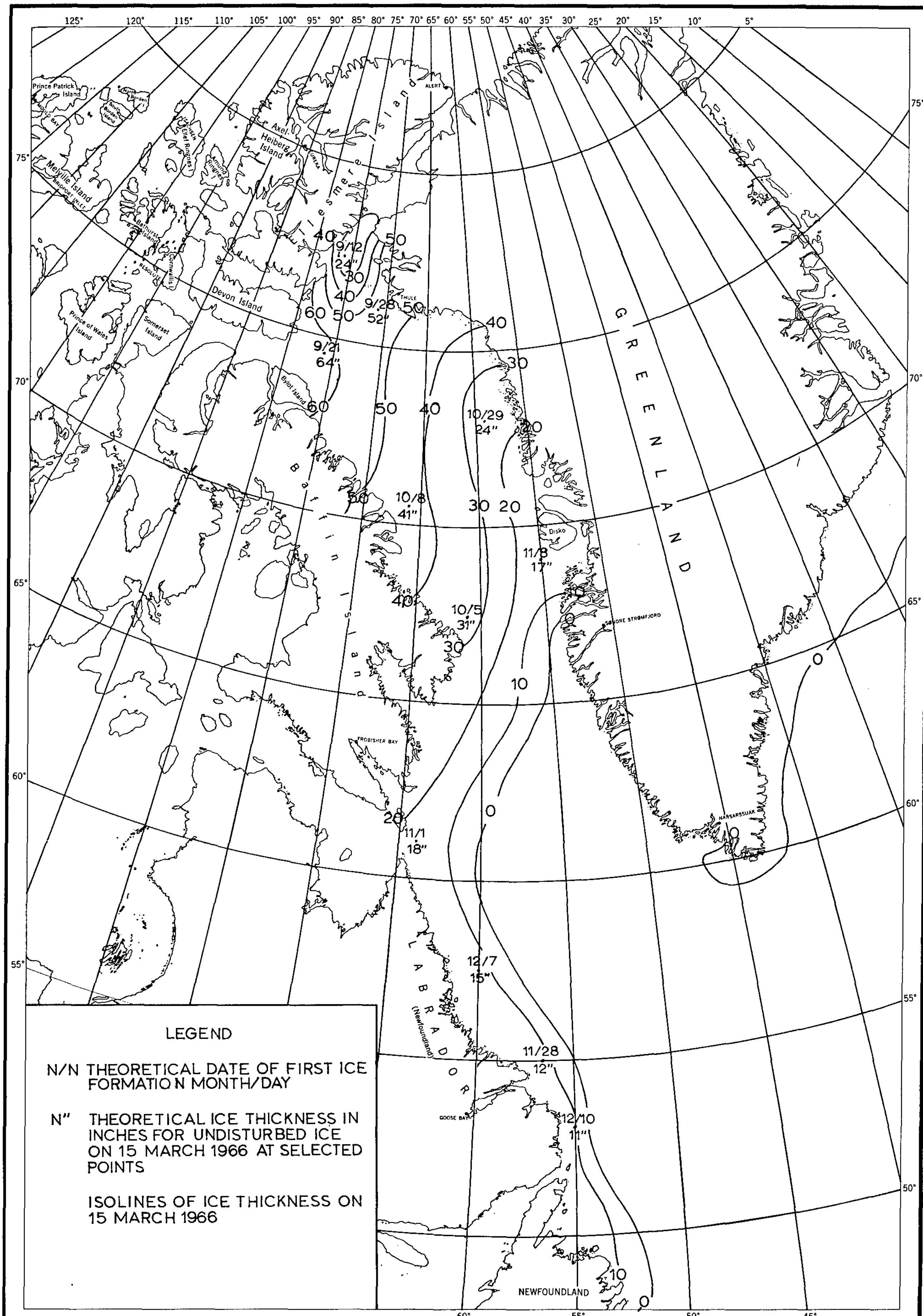

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FIGURE 2 COMPUTED ICE THICKNESS FOR UNDISTURBED ICE ON 15 MARCH 1966

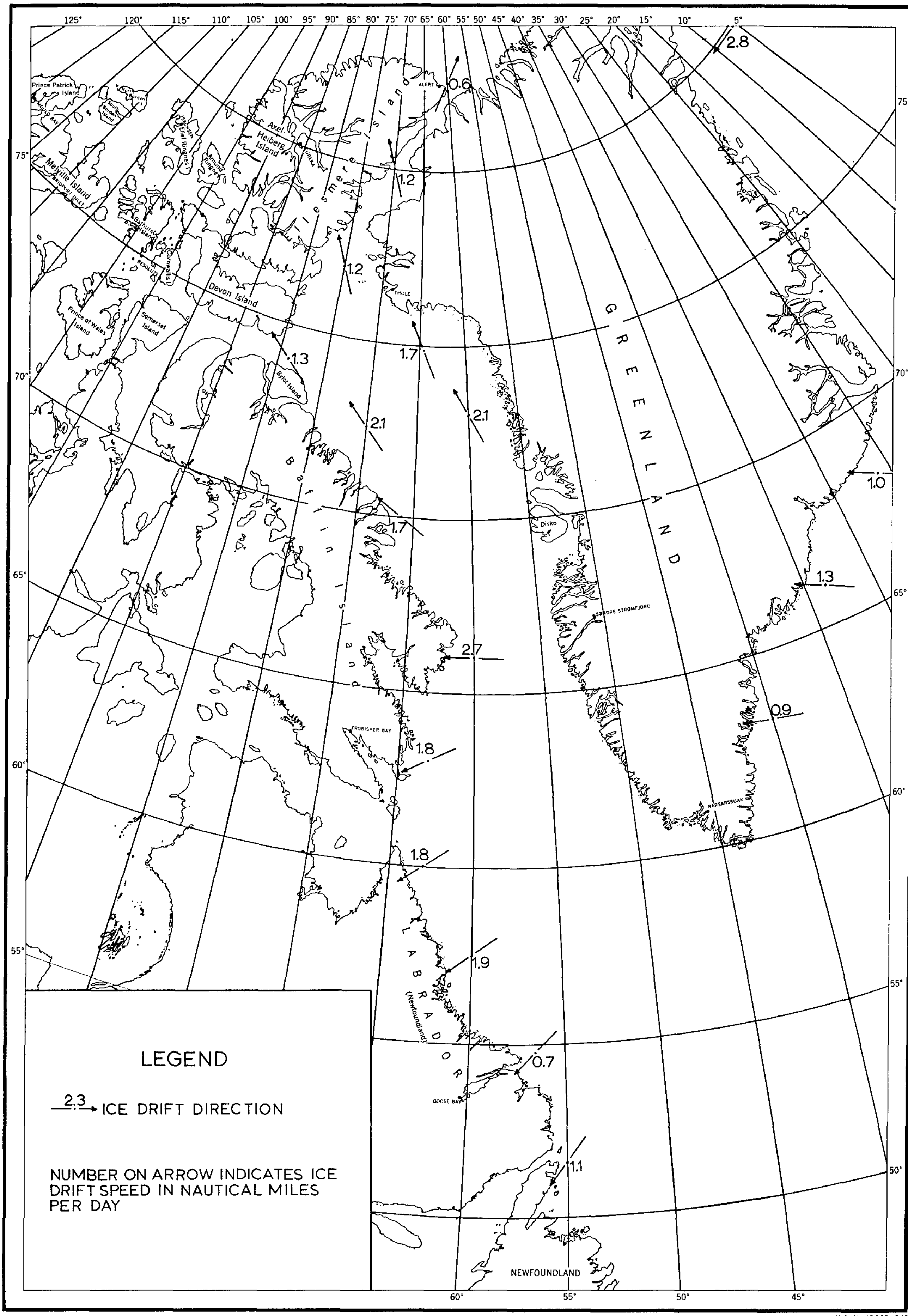

FIGURE 3 COMPUTED MEAN ICE DRIFT 15 OCTOBER 1965 THROUGH 15 MARCH 1966

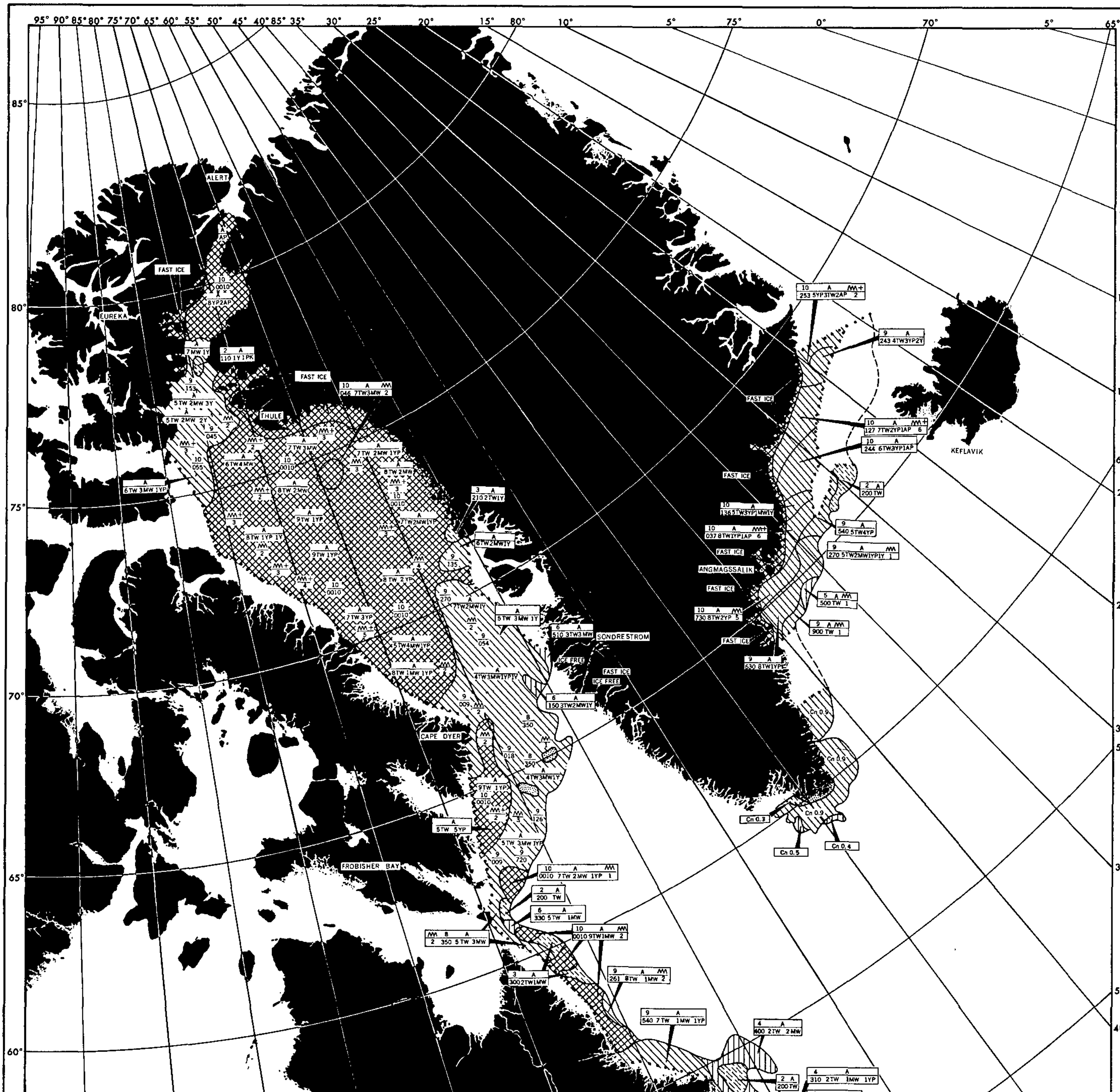

FIGURE 4 OBSERVED ICE CONDITIONS 31 MARCH TO 6 APRIL 1966

KEY TO ICE SYMBOLS

TOTAL CONCENTRATION

- Ice free
- < 0.1 (open water)
- 0.1 thru 0.3 (very open pack)
- 0.4 thru 0.6 (open pack)
- 0.7 thru 0.9 (close pack)
- 1.0 fast or (very close pack)

BOUNDARY

- observed
- radar
- limit of observed data

TOPOGRAPHY

- rafted
- ridged
- hummocked

Examples: $\frac{\text{ᴧᴧᴧ}}{(n)}$ –, $\frac{\text{ᴧᴧᴧ}}{(n)}$+

+ after symbol indicates average height is 10 ft. or greater.

— after symbol indicates average height is less than 10 ft.

(n) tenths coverage on ice

COVERAGE BY SIZE

$\frac{Cn}{n_1 n_2 n_3}$

Cn = total concentration

n_1	SL =	Slush	
	BSH =	Brash	<2m (<6.6 ft)
	SCAKE =	Small Ice Cake	<2m (<6.6 ft)
	PK =	Pancake Ice	30 cm—3 m (12 in—9.8 ft)
	CAKE =	Ice Cake	<10 m (<32.8 ft)
n_2	SMF =	Small Ice Floe	10—200 m (32.8—656 ft)
	MDF =	Medium Ice Floe	200—1,000 m (656—3,281 ft)
n_3	BGF =	Big Ice Floe	1—<10 km (3,281 ft—<5.4 nm)
	VAF =	Vast Ice Floe	>10 km (>5.4 nm)

Example: $\frac{9}{243}$ BSH

9 = total concentration
2 = tenths all brash ice
4 = tenths, small and medium ice floes
3 = tenths, big and vast ice floes

STAGE OF DEVELOPMENT

$\frac{A}{\text{tenths predominant, tenths secondary}}$

AGE		AVERAGE THICKNESS
IC =	Ice Crystals	
SL =	Slush	<5 cm (<2 in)
IR =	Ice Rind	<5 cm (<2 in)
PK =	Pancake	<5 cm (<2 in)
Y =	Young	5—15 cm (2—6 in)
MW =	Medium Winter	15—30 cm (6—12 in)
TW =	Thick Winter	>30 cm (>12 in)
WT =	Winter	15 cm—2 m (6 in—6.6 ft)
PL =	Polar	<3 m (<9.8 ft)
YP =	Young Polar	<2.5 m (<8.2 ft)
AP =	Arctic Pack	>2.5 m (>8.2 ft)

Example: $\frac{A}{7MW3SL}$

A = Stage of development
7MW = 7 tenths Medium Winter
3SL = 3 tenths Slush

STAGE OF MELTING

$\frac{PD}{(n) + (n)\,F}$

PD = puddling

(n) = tenths coverage on ice

(n) F = tenths coverage on ice, Frozen

Examples:

$\frac{PD}{3}$ = 3 tenths puddling

$\frac{PD}{3F}$ = 3 tenths frozen puddles

$\frac{TH}{(n)}$ = thaw holes — same entry procedure as above

UNDERCAST

Limit

THICKNESS OF ICE AND SNOW

$\frac{T}{n}$ = ice thickness in inches

$\frac{SD}{n}$ = snow depth in inches

$\frac{S}{n}$ = snow cover in tenths

PHENOMENA

- crack
- polynya
- lead
- (n) icebergs
- (n) bergy bits & growlers

(n) = number in area

FIGURE 5

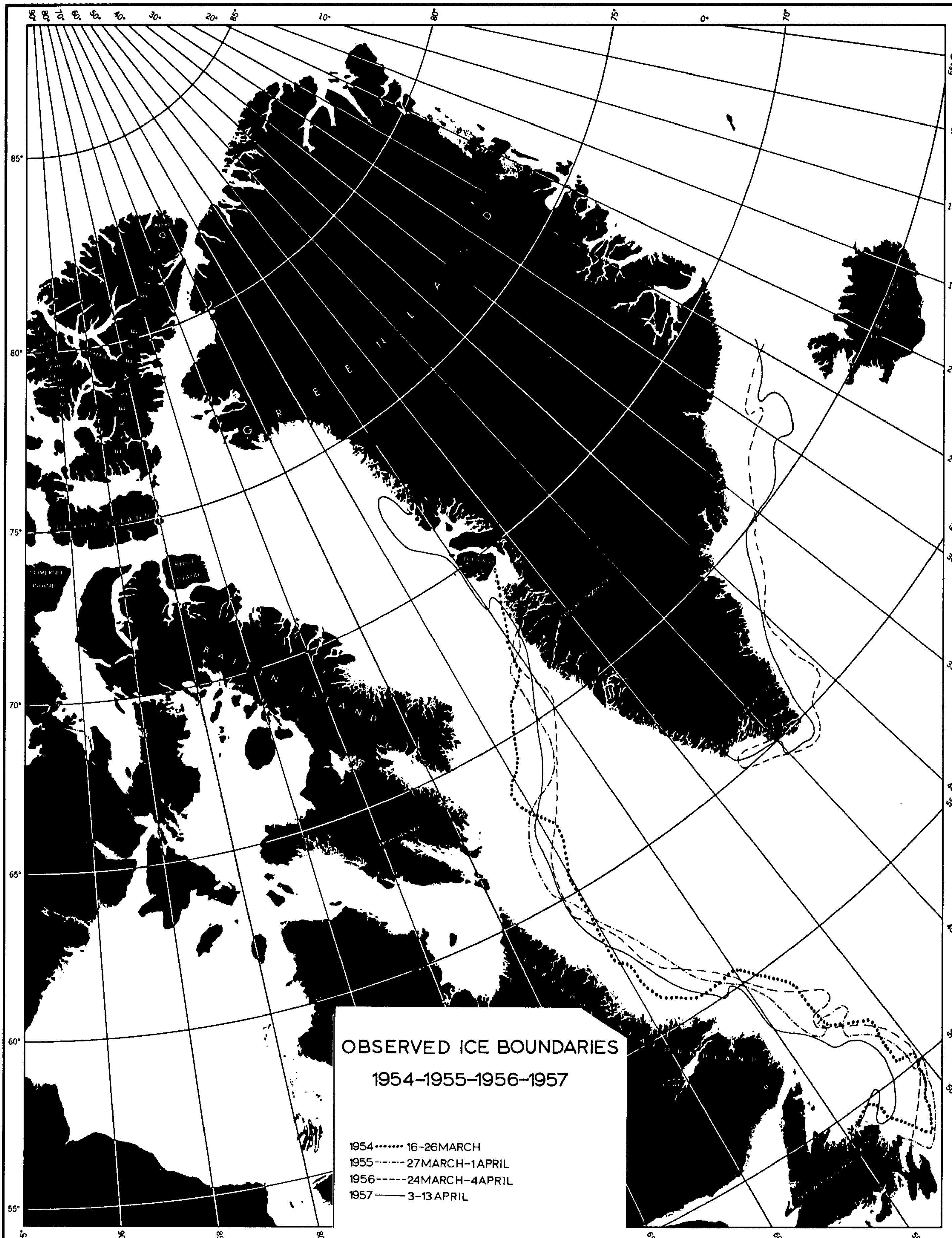

FIGURE 6 COMPARISON OF OBSERVED ICE BOUNDARIES ON PRELIMINARY RECONNAISSANCE

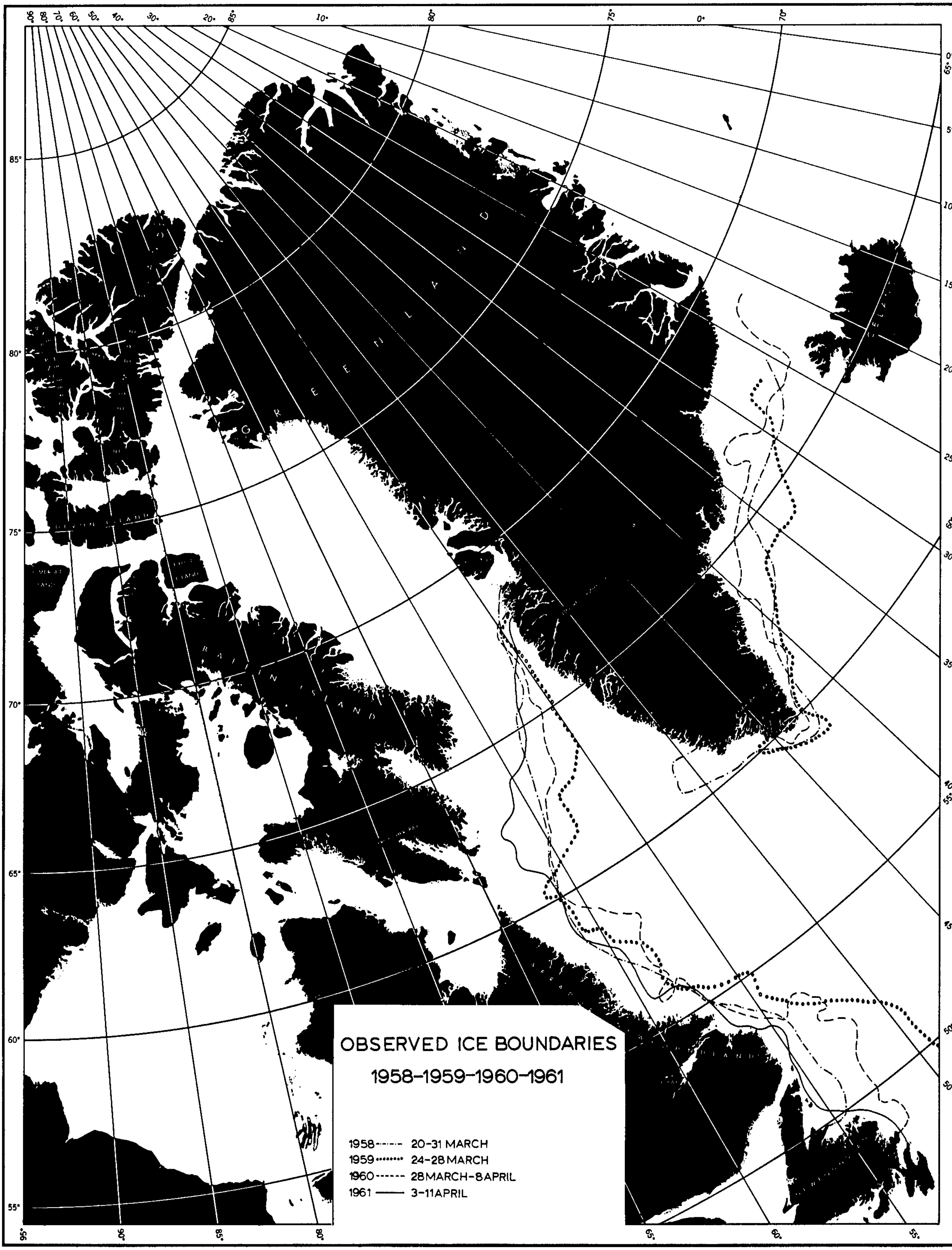

FIGURE 7 COMPARISON OF OBSERVED ICE BOUNDARIES ON PRELIMINARY RECONNAISSANCE

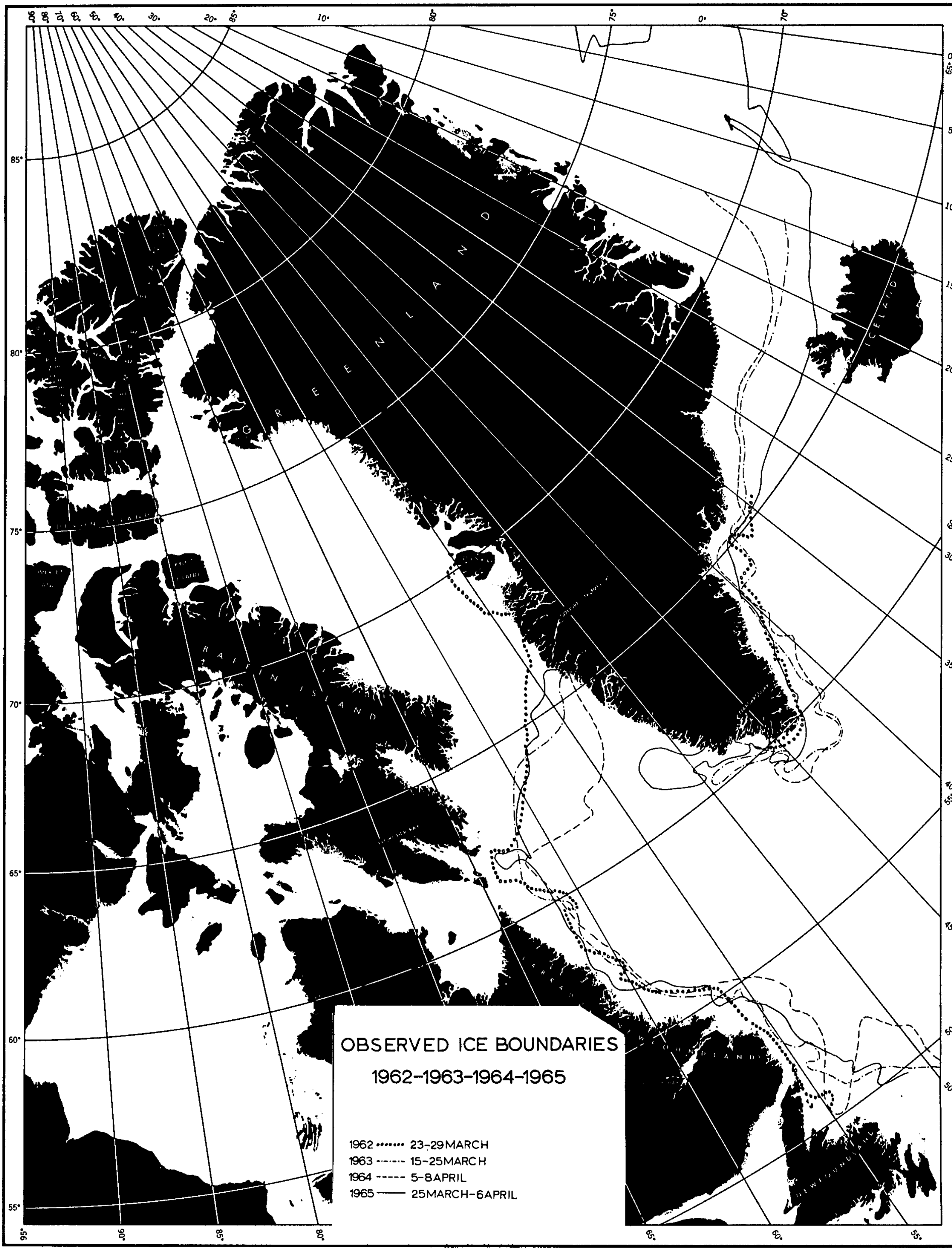

FIGURE 8 COMPARISON OF OBSERVED ICE BOUNDARIES ON PRELIMINARY RECONNAISSANCE

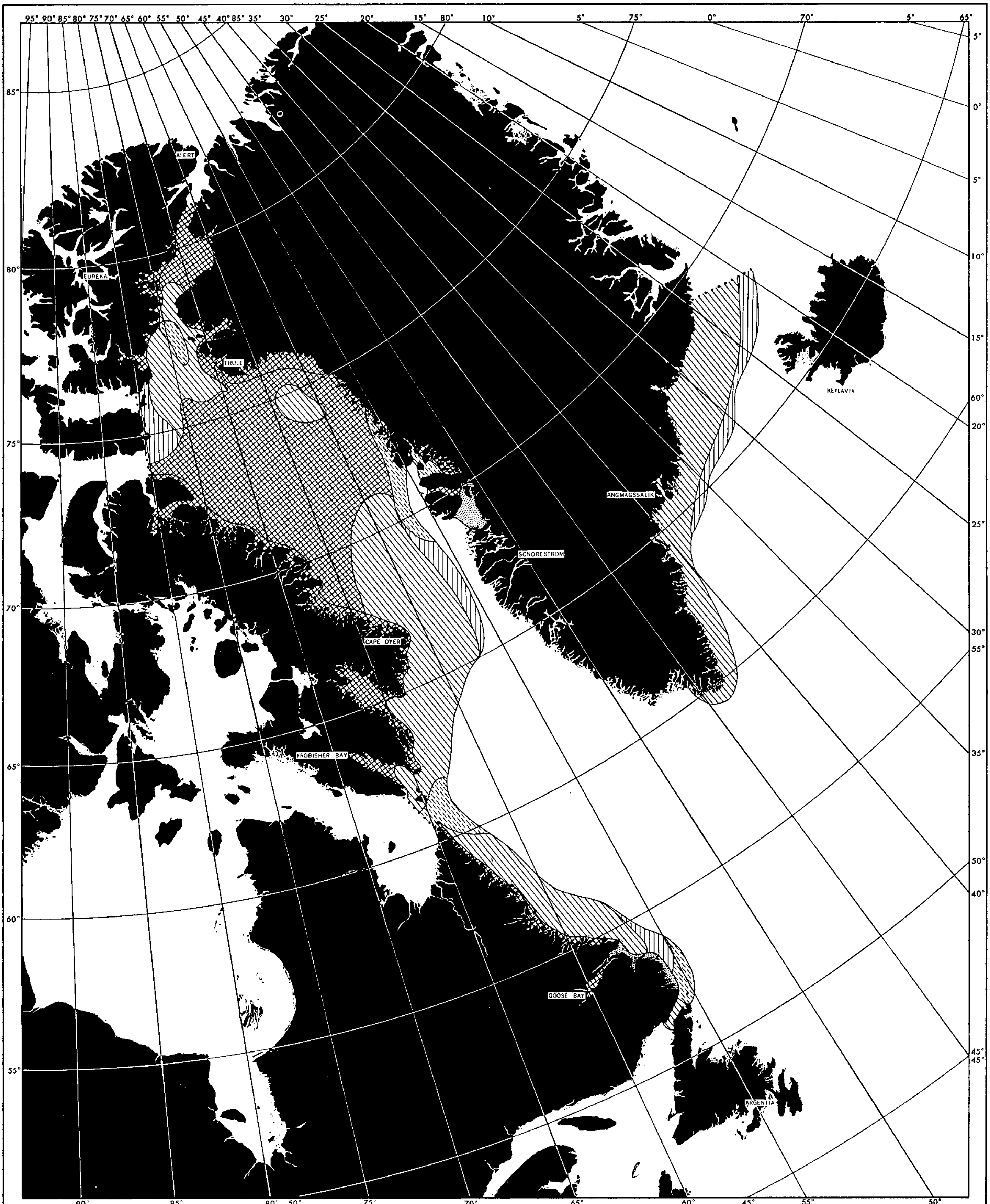

FIGURE 9 PROGNOSTIC ICE CHART MID-MAY 1966

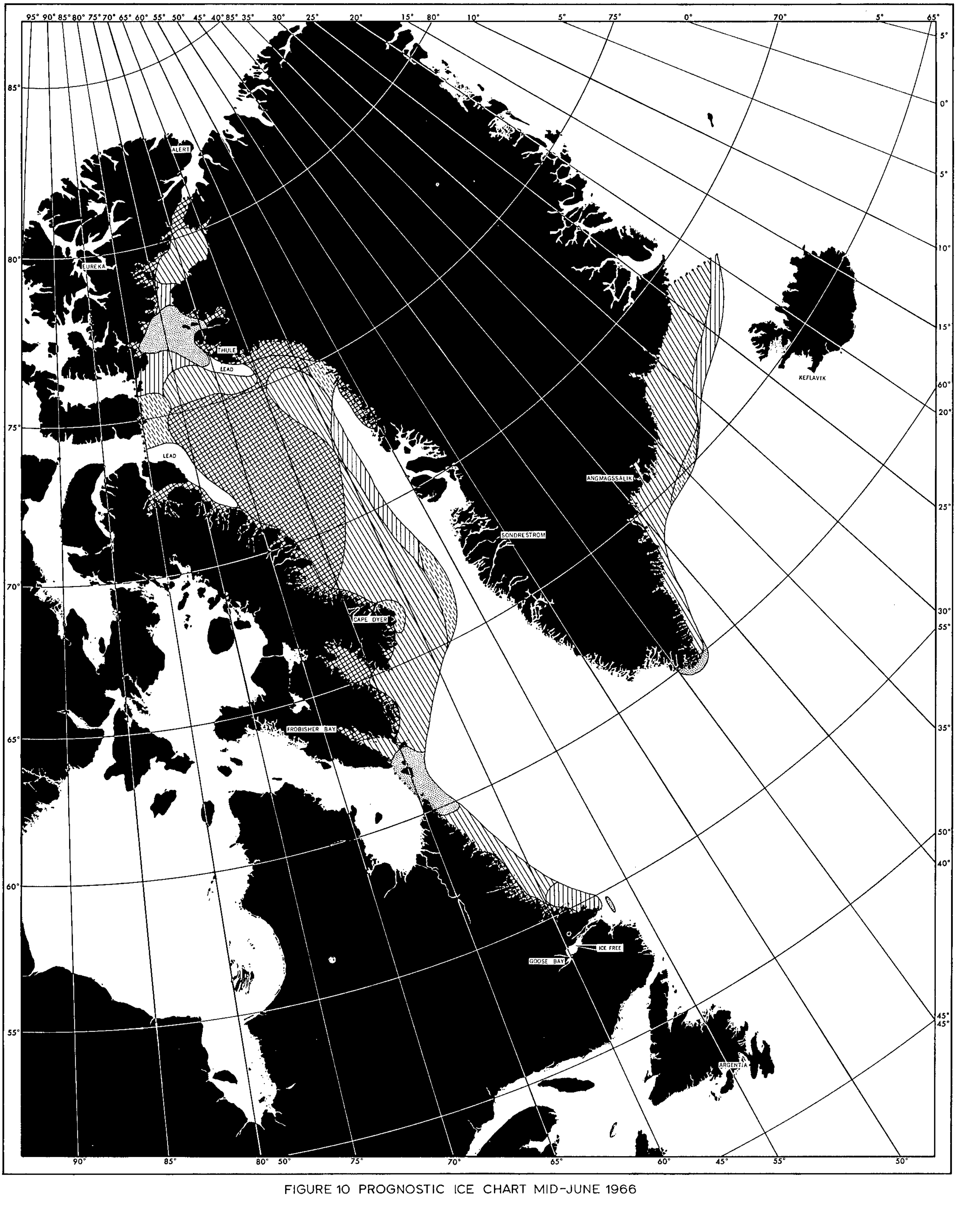

FIGURE 10 PROGNOSTIC ICE CHART MID-JUNE 1966

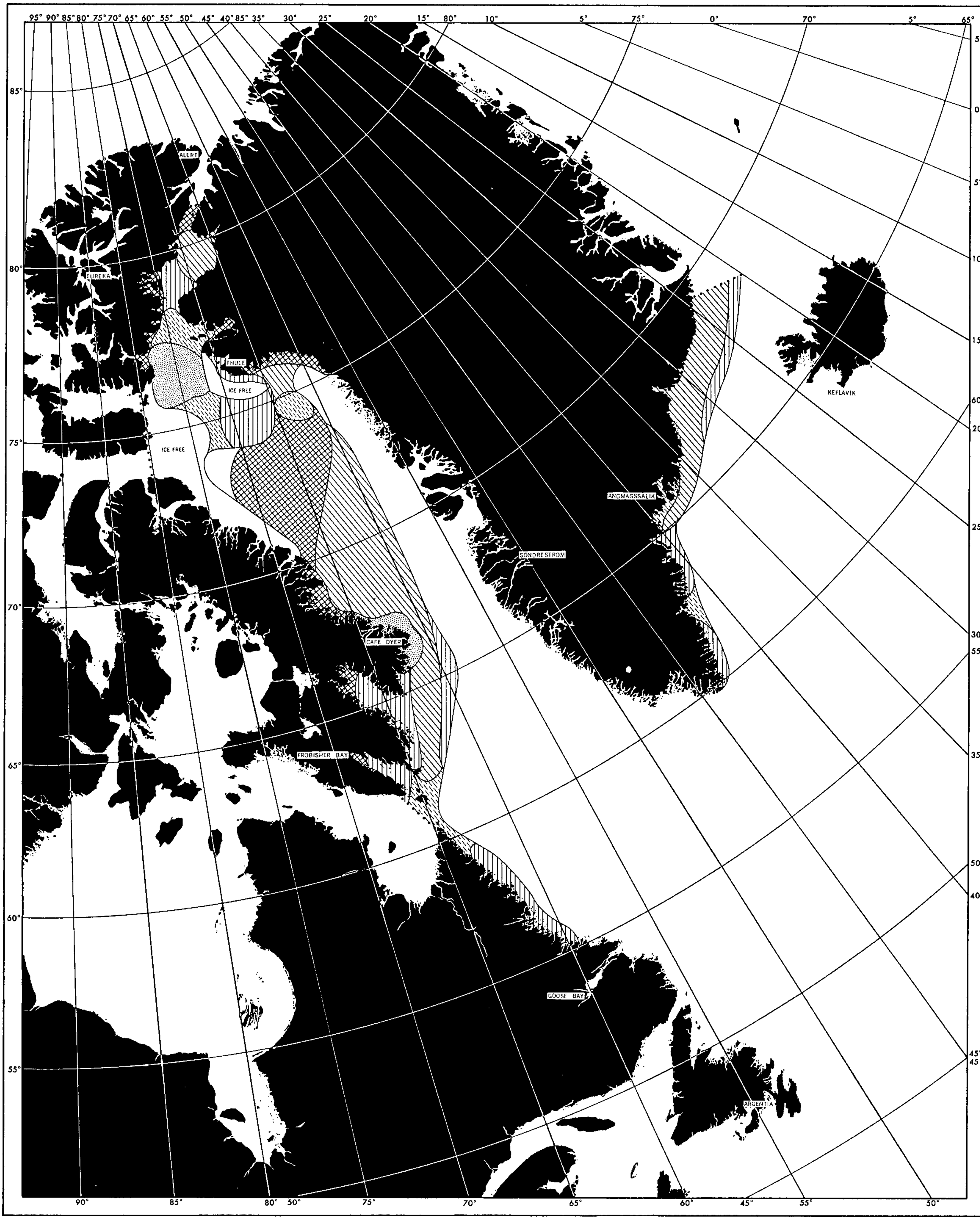

FIGURE 11 PROGNOSTIC ICE CHART MID-JULY 1966

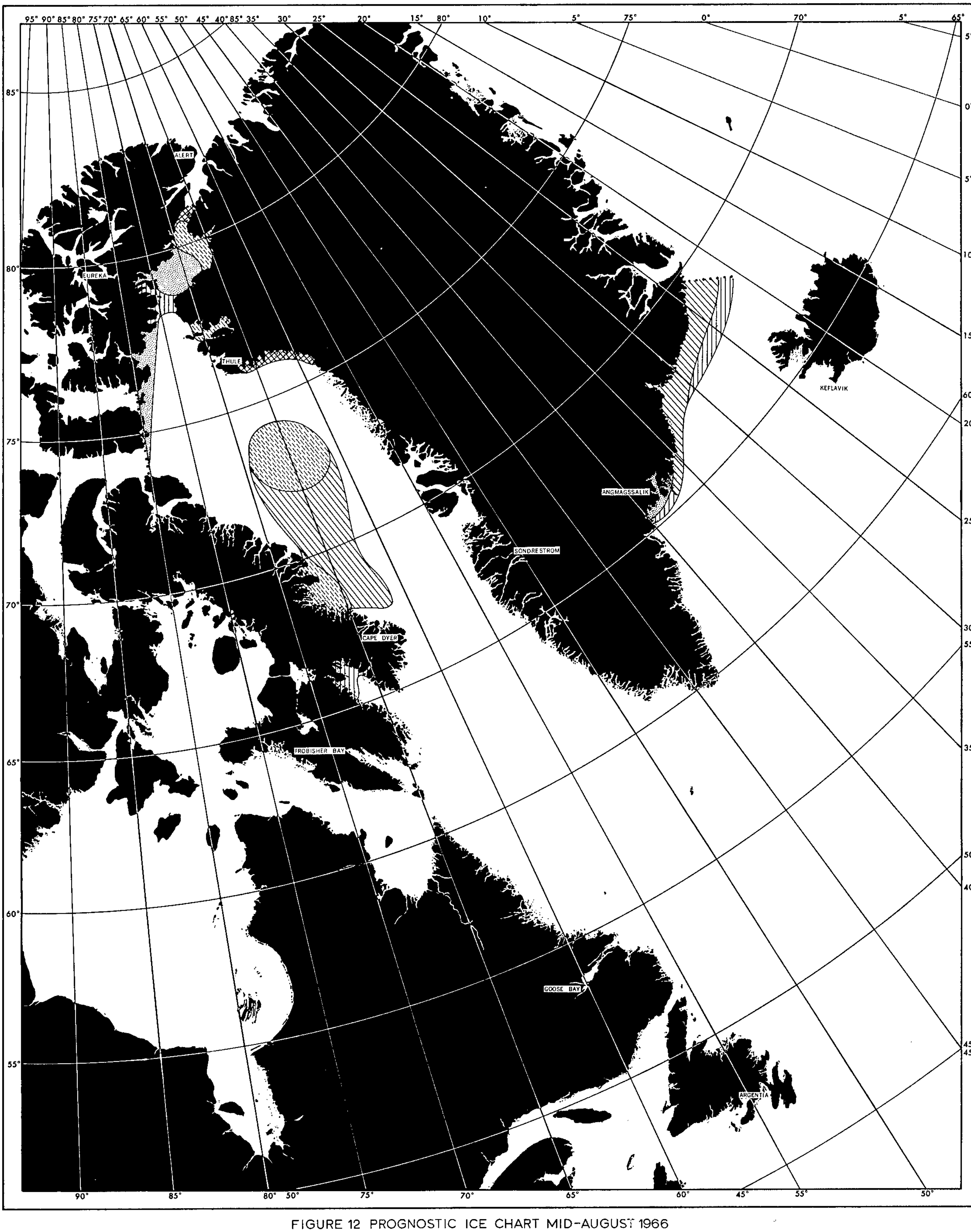

FIGURE 12 PROGNOSTIC ICE CHART MID-AUGUST 1966

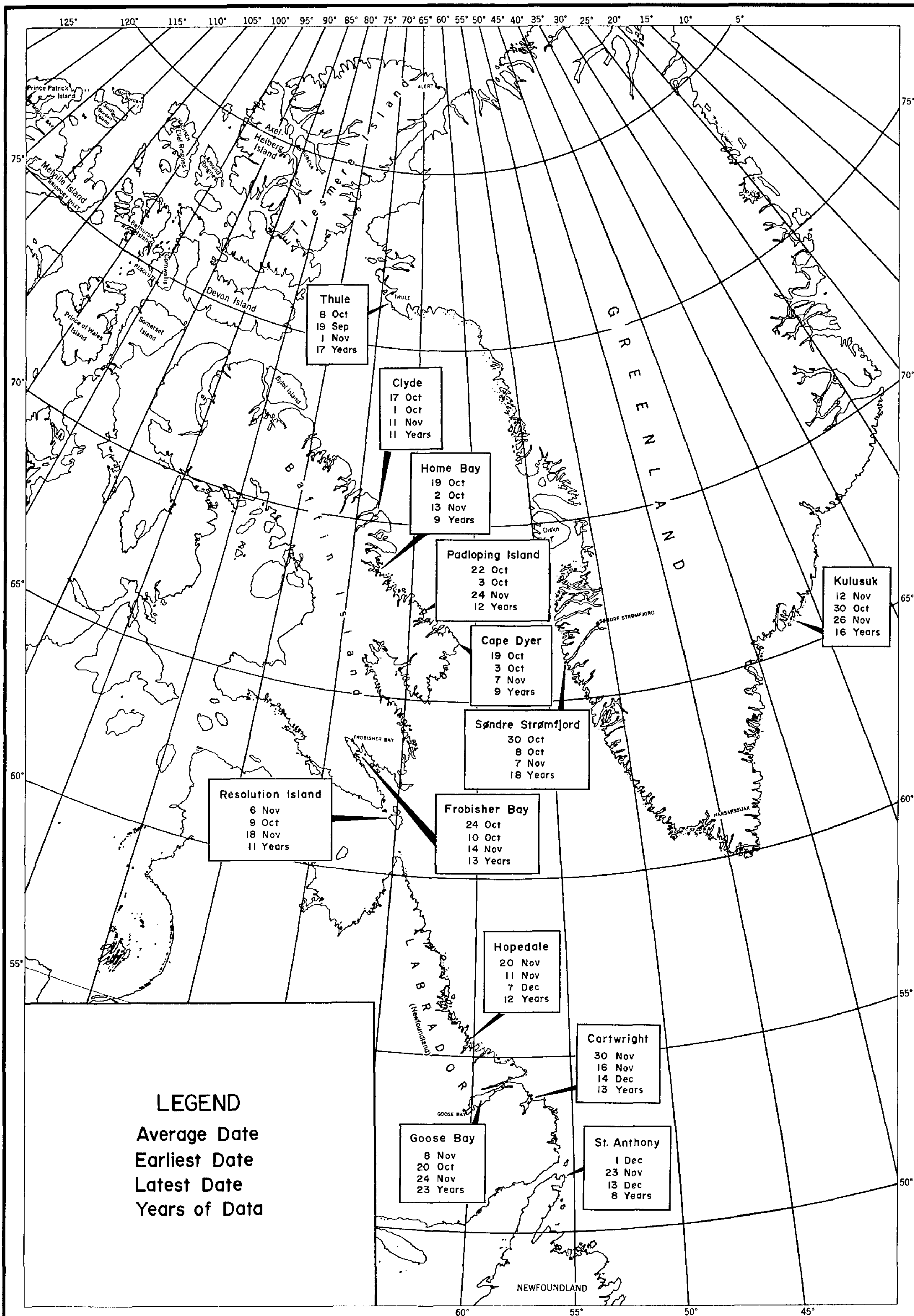

FIGURE 13 DATES OF INITIAL FREEZEUP

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11. SUPPLEMENTARY NOTES	12. SPONSORING MILITARY ACTIVITY
	U.S. Naval Oceanographic Office

13. ABSTRACT An outlook of expected sea ice conditions in the eastern North American Arctic is presented for the period mid-May through mid-August 1966. Oceanographic and climatic data for the Eastern Arctic were analyzed in terms of sea ice growth during the past winter. These analyses, combined with observed ice conditions for the period 31 March through 6 April and a comprehensive study of historical ice and climatic information, formed the basis for the 1966 Ice Outlook. Evaluation of this information indicates that present ice conditions in the Labrador Sea and along the Newfoundland coast are similar to those observed in 1960. However, present and prognostic weather conditions indicate a trend toward lighter than normal conditions along the Labrador coast similar to those observed in 1965. Extremely heavy ice conditions in conjunction with environmental factors indicate 1957 and 1958 to be analogous years in the approaches to Kulusuk and in Baffin Bay, respectively. Accordingly, Goose Bay is expected to open earlier than normal and Thule, Sondre Stromfjord, and Kulusuk later than normal. The approaches to Itivdleq were reported ice free by the early reconnaissance on 3 April. In terms of the 1965 ice season, Goose Bay will open slightly earlier than last year, Thule and Kulusuk about one week later, and Sondre Stromfjord about 10 days to two weeks later than in 1965.

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14. KEY WORDS	LINK A		LINK B		LINK C	
	ROLE	WT	ROLE	WT	ROLE	WT
FREEZING						
ICE						
MELTING						
OCEANOGRAPHIC DATA						
ICE DATA						
POLAR REGIONS						
WATER						
SEA WATER						

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Security Classification

U. S. Naval Oceanographic Office
LONG-RANGE ICE OUTLOOK, EASTERN ARCTIC (1966). May 1966. 9 p. text and 13 figures. SP-60(66)

An analysis of oceanographic and climatic data for forecasting the ice growth during the winter 1965-66 and the climatic outlook for the 1966 Arctic shipping season are included. Results of a preliminary survey of sea-ice conditions in the Labrador Sea, Davis Strait, Denmark Strait, and Baffin Bay are presented. A series of charts shows monthly prognostic sea-ice conditions from mid-May through mid-August 1966. Opening dates and harbor freezing information are included.

1. Ice Forecasting, Arctic
2. Ice Distribution, Arctic
3. Climate, Arctic

i. title: Long-Range Ice Outlook, Eastern Arctic (1966)
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